

**ELECTROMAGNETIC INDUCTION DETECTION SYSTEM****ABSTRACT OF THE DISCLOSURE**

A airborne electromagnetic induction (EMI) detection apparatus and system. In accordance with one embodiment, the EMI detection apparatus includes a transmitter element in the form of a transmitter coil that emits a primary, multi-frequency component magnetic field which induces a secondary magnetic field in an external body. A receiver element in the form of a receiver coil is mounted in a horizontal loop-loop orientation with respect to the transmitter coil and receives the secondary magnetic field. The detection apparatus further includes a magnetic shield disposed around the receiver coil to limit the lateral footprint diameter observed by the receiving element and to shield the receiver coil from the primary magnetic field and other external electromagnetic radiation to improve the gain and resolution of the detection apparatus.